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SEA BETA-GALACTOSIDASE

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L2 1064 S L1 AND THERMOPHILUS
L3 15 S L2 AND (4 DEGREE)
L4 7 DUP REM L3 (8 DUPLICATES REMOVED)

=> d 14 ibib ab 1-7

L4 ANSWER 1 OF 7 FSTA COPYRIGHT 2004 IFIS on STN

ACCESSION NUMBER: 2002:P1210 FSTA

TITLE: Evolution of carbohydrate fraction in carbonated fermented milks as affected by **.beta.-galactosidase** activity of starter strains.

AUTHOR: Gueimonde, M.; Corzo, N.; Vinderola, G.; Reinheimer, J.; Reyes-Gavilan, C. G. de los

CORPORATE SOURCE: Correspondence (Reprint) address, C. G. de los Reyes-Gavilan, Inst. de Productos Lacteos de Asturias (CSIC), Ctra. de Infiesto s/n, 33300 Villaviciosa, Asturias, Spain. E-mail greyes_gavilan(a)ipla.csic.es

SOURCE: Journal of Dairy Research, (2002) 69 (1) 125-137, 14 ref.

ISSN: 0022-0299

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Effects of carbonation on evolution of lactose, galactose and glucose in fermented milks with added probiotic bacteria (*Lactobacillus casei*, *L. acidophilus* and/or *Bifidobacterium bifidum*) were evaluated and related to **.beta.-galactosidase** activity of starter strains. Raw milk mixed with skim milk powder was pasteurized and divided into 2 lots, 1 of which was carbonated with CO₂ to pH 6.3. During incubation at 42.degree.C and the 1st days of refrigeration at 4.degree.C, lactose hydrolysis, resulting in liberation of galactose and glucose, occurred in CT (*Streptococcus thermophilus*/L. casei), AT (*S. thermophilus*/L. acidophilus) and ABT (*S. thermophilus*/L. acidophilus/B. bifidum) fermented milks. Levels of galactose were higher than those of glucose and could be related to preferential consumption of glucose by actively-growing bacteria. During incubation, lactose and monosaccharide levels were not affected by milk carbonation. However, during refrigerated storage, the presence of CO₂ was associated with slightly lower contents of lactose and higher levels of galactose and glucose in AT and ABT, but not CT fermented milks. During refrigeration, galactose was moderately utilized by *L. acidophilus* in AT products, but *B. bifidum* seemed to prevent consumption of this sugar in ABT fermented milks. Glucose remained constant, with minor variations, in CT products, but a continuous increase occurred in carbonated AT and ABT fermented milks during storage. **.beta.-Galactosidase** activity displayed by *S. thermophilus* strains was similar at pH 6.5 (initial pH of non-carbonate sample) and pH 6.3 (initial pH of carbonated sample) whereas *L. acidophilus* LaA3 showed greater **.beta.-galactosidase** activity at pH 6.3 than at higher pH values. Enhanced metabolic activity of *L. acidophilus* at low initial pH of carbonated milk also promoted higher cellular **.beta.-galactosidase** activity that could have released greater amounts of galactose and glucose from lactose in AT and ABT fermented milks during refrigeration. It is suggested that in CT fermented milks, similar **.beta.-galactosidase** activity levels of *S. thermophilus* at pH 6.5 and 6.3 together, with the absence of **.beta.-galactosidase** activity in *L. casei*, could explain the lack of differences in glucose and galactose content between carbonated and non-carbonated samples.

L4 ANSWER 2 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1

ACCESSION NUMBER: 1997:115317 CAPLUS

DOCUMENT NUMBER: 126:170599

TITLE: Effect of polymers and storage temperature on the stability of freeze-dried lactic acid bacteria

AUTHOR(S): Champagne, Claude P.; Mondou, Francine; Raymond, Yves; Roy, Denis

CORPORATE SOURCE: Food Research and Development Centre, Agriculture

SOURCE: Canada, Saint-Hyacinthe, QC, J2S 8E3, Can.
Food Research International (1996), 29(5-6), 555-562
CODEN: FORIEU; ISSN: 0963-9969
PUBLISHER: Elsevier
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The effect of the addn. of gelatin, xanthan gum or maltodextrins on the survival during freeze-drying and stability during storage of four lactic acid bacteria were studied. The polymers were added to a milk-sucrose base medium and mixed with the cell conc. The water activity of the cultures was adjusted to 0.22 prior to storage at -20, 4 or 20.degree.C. None of the polymers generated marked improvement of the milk-sucrose medium in terms of survival of bacteria during freeze-drying. There were significant differences in mortality rates between strains. Gelatin improved the storage stability of freeze-dried Lactobacillus casei ssp. rhamnosus R011 and Bifidobacterium longum R023 cultures kept at 20 and 4.degree.C, resp. Also bacterial populations of Lactococcus lactis ssp. lactis R058, following 12 mo at 4.degree.C, were higher than controls when gelatin was added to the freeze-drying medium. Overall, the additives had a detrimental effect on the stability of Streptococcus thermophilus R057 during storage at 20.degree.C. The B. longum R023 .alpha.- and .beta.-galactosidase activity losses during storage at 20.degree.C were approx. twice those obsd. at 4 and -20.degree.C, while viable count losses at 20.degree.C were approx. 100.times. greater than those at 4.degree.C.

L4 ANSWER 3 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2
ACCESSION NUMBER: 1992:590521 CAPLUS
DOCUMENT NUMBER: 117:190521
TITLE: Lactase activity in yogurt and lactic acid bacteria
AUTHOR(S): Lee, Kwang Hee
CORPORATE SOURCE: Dep. Food Sci. Nutr., Daegu Junior Coll., Kyungbuk, 702-260, S. Korea
SOURCE: Han'guk Yongyang Siklyong Hakhoechi (1992), 21(1), 60-3
CODEN: HYSHDL; ISSN: 0253-3154
DOCUMENT TYPE: Journal
LANGUAGE: Korean

AB Individual starter cultures were inoculated into liq. medium and incubated at 40.degree. for 16 h. Whole cells were obtained and evaluated for .beta.-galactosidase activity using orthonitrophenyl-.beta.-D-galactopyranoside (ONPG) as substrate. S. thermophilus had more .beta.-galactosidase activity than other lactobacilli did. To study the effect of storage temp.; on enzyme activity of yogurt, some samples of cultured yogurt were stored under refrigeration (4.degree.) or at room temp. (23.degree.). At 4.degree., yogurt had .beta.-galactosidase activity and many viable bacteria in 1 mo. After 20 days, yogurt had max. .beta.-galactosidase activity. At 23.degree., yogurt had .beta.-galactosidase activity by 5 days. .beta.-Galactosidase activity was ascribed to viable bacteria, esp. S. thermophilus. Com. yogurt had lower .beta.-galactosidase activity. There were considerable variations with regard to the lactose hydrolyzing capabilities of com. yogurt samples.

L4 ANSWER 4 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 3
ACCESSION NUMBER: 1992:424978 CAPLUS
DOCUMENT NUMBER: 117:24978
TITLE: Stability of Lactobacillus delbrueckii ssp. bulgaricus, Streptococcus salivarius ssp. thermophilus and .beta.-galactosidase activity in frozen cultured ice

and equally strong for each strain. The lactose hydrolysis activities were similar for 8 strains; 1 strain was particularly active and 1 not very active. The temp. for optimal activity (ONPG) went from 49.degree. to 53.degree. but were not related to the optimal growth temp. in M 17 medium. Optimal pH measurements were between 8 and 9 in Tris buffer and between 7.3 and 7.8 in Na-phosphate buffer. Phosphate ions inhibited I but not II. The I and II for a strain were identically heat resistant; however that varied with the strains. These enzymes were stable at 4.degree. and were not stabilized by (NH₄)₂SO₄. The 2 activities were enhanced by .beta.-mercaptoethanol. The affinity of I for ONPG varied slightly with the strains (K_m 0.15-0.38 mM). An excess of ONPG, but not of lactose, inhibited I. The affinity for lactose was 22 mM. Lactose behaved like a competitive inhibitor in regard to ONPG and ONPG-6-P. However the action of galactose on the hydrolysis kinetics was very moderate, sometimes activating. The II affinity for ONPG-6-P (K_m = 6.6 mM) was much lower than that of I for ONPG. These results seem to confirm the previous hypothesis by which *S. thermophilus* strains possess .gtoreq.2 isoenzymes which have an affinity with .beta.-galactosides (I type) as well as 6-phospho-.beta.-galactosides (II type). Their properties suggest a possible oligomeric structure of the enzymes. Moreover their properties are different from those of the mesophilic lactic streptococci (*S. lactis* and *S. cremoris*).

L4 ANSWER 7 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN
 ACCESSION NUMBER: 1980:509501 CAPLUS
 DOCUMENT NUMBER: 93:109501
 TITLE: .beta.-D-Galactoside galactohydrolase of *Streptococcus thermophilus*: induction, purification, and properties
 AUTHOR(S): Somkuti, G. A.; Steinberg, D. H.
 CORPORATE SOURCE: Sci. Educ. Adm., U. S. Dep. Agric., Philadelphia, PA, 19118, USA
 SOURCE: Journal of Applied Biochemistry (1979), 1(5-6), 357-68
 CODEN: JABIDV; ISSN: 0161-7354
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB .beta.-Galactosidase (EC 3.2.1.23) (I) in *S. thermophilus* was induced by lactose and galactose, but not by isopropyl-.beta.-D-galactoside or methyl-.beta.-D-thiogalactoside. Addn. of glucose to induced cultures repressed further synthesis. I was purified 26-fold from cell-free exts. by DEAE-cellulose chromatog. and Sephadex G-100 column chromatog. The mol. wt. was 105,000, and the optimum temp. and pH for activity were 55.degree. and pH 8.0, resp. Mg²⁺, 2-mercaptoethanol, and dithiothreitol stimulated I activity. EDTA, p-hydroxymercuribenzoate, Ca²⁺, and Mn²⁺ were inhibitory. The K_m for o-nitrophenyl-.beta.-D-galactopyranoside was 0.69 mM. *S. thermophilus* I was stable in aq. soln. in the presence of 10% glycerol, retaining full activity at 4.degree. for .gtoreq.3 mo.

cream
AUTHOR(S): Mashayekh, Morteza; Brown, Rodney J.
CORPORATE SOURCE: Dep. Nutr. Food Sci., Utah State Univ., Logan, UT,
84322-8700, USA
SOURCE: Cultured Dairy Products Journal (1992), 27(1), 4-6, 8
CODEN: CDPJDE; ISSN: 0045-9259
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Ice cream mix was cultured with *S. salivarius thermophilus* and *L. delbrueckii bulgaricus* to four different pH levels, then frozen in a batch ice cream freezer. A consumer panel selected pH 4.9 as the optimum acidity. Another panel compared product at pH 4.9 contg. 10, 15 and 20% strawberry flavoring. The level of flavoring did not significantly influence preference. Starter culture populations and **.beta.-galactosidase** activity were monitored for one month in both yogurt and cultured ice cream. **.beta.-Galactosidase** activity and colony counts in yogurt progressively decreased during 31 days of storage at **4.degree.** Cultured ice cream maintained 89% of its lactase activity and lost less than one half log cycle of viable colony counts while stored frozen for 1 mo.

L4 ANSWER 5 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 4

ACCESSION NUMBER: 1990:568039 CAPLUS

DOCUMENT NUMBER: 113:168039

TITLE: Immobilization of **.beta.-galactosidase** by covalent attachment to porous glass

AUTHOR(S): Arora, Rakesh; Sinha, P. R.

CORPORATE SOURCE: Anim. Biochem. Div., Natl. Dairy Res. Inst., Karnal, 132001, India

SOURCE: Indian Journal of Dairy Science (1989), 42(2), 159-64
CODEN: IJDSAI; ISSN: 0019-5146

DOCUMENT TYPE: Journal

LANGUAGE: English

AB **.beta.-Galactosidase** of *Streptococcus thermophilus* was immobilized on controlled pore glass beads. Optimum temp. of incubation, pH, and pH stability of the immobilized enzyme were similar to the native enzyme although Km values of the immobilized were higher than those of the native enzymes with ONPG substrate. Immobilized enzymes was much more stable at **4.degree.** and **37.degree.** as compared to native enzyme. The enzyme is useful in economic prodn. of low lactose milk.

L4 ANSWER 6 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1981:134693 CAPLUS

DOCUMENT NUMBER: 94:134693

TITLE: **.beta.-Galactosidases** and phospho-**.beta.-galactosidases** of *Streptococcus thermophilus*

AUTHOR(S): Hemme, D.; Nardi, Michele; Jette, D.

CORPORATE SOURCE: Lab. Microbiol. Laitiere Genie Alimentaire, Inst. Natl. Rech. Agron., Jouy-en-Josas, 78350, Fr.

SOURCE: Lait (1980), 60(599-600), 595-618
CODEN: LAITAG; ISSN: 0023-7302

DOCUMENT TYPE: Journal

LANGUAGE: French

AB The **.beta.-galactosidases** (I) and phospho-**.beta.-galactosidases** (II) of 10 *S. thermophilus* strains were studied by comparing some of their properties using crude sol. exts. The optimal growth temp. in M 17 medium varied from 49.degree. to 53.degree. depending upon the strains. The strains can be divided into 3 groups according to the sp. activities of I and II. The o-nitrophenyl-**.beta.-D-galactoside** (ONPG) and o-nitrophenyl-**.beta.-D-6-phosphogalactoside** (ONPG-6-P) hydrolysis activities were always present